

REMARKS

Claims 1-10 have been examined and remain in the Application. Claim 1 has been amended. Claims 11-19 have been added. Accordingly, Claims 1-19 are pending.

I. 35 U.S.C. § 112, second paragraph

In the Office Action dated July 9, 2002, the Examiner has rejected Claims 1-6 under 35 U.S.C. § 112, second paragraph for various informalities. The Examiner indicates that the language “in one or more regions having sizes of the order of 1 micrometer or less are irradiated” recited in Claim 1 is unclear. Applicant has amended Claim 1, in our previous response filed on April 29, 2002, to clarify that the one or more regions having individual sizes in the order of 1 micrometer or less are selectively irradiated. Additionally, Applicant has deleted from Claim 1 the language “wherein the material is a thin-layers material comprising buried layers deposited on a substrate” and added the recitation “deposited on a substrate” to the preamble of Claim 1, as suggested by the Examiner. Accordingly, Applicant respectfully requests that the rejection under 35 U.S.C. § 112, second paragraph, be withdrawn.

II. 35 U.S.C. § 112, first paragraph

Claims 1 - 10 were rejected under 35 U.S.C. § 112, first paragraph, as containing subject matter which was not described in the specification. In response, Applicant has deleted the language “without overall mixing of the different layers of the multi-layer material” and “2 or 3 nearest” from Claim 1. It is therefore respectfully requested that the rejection under 35 U.S.C. § 112, first paragraph, be withdrawn.

In the Office Action dated July 9, 2002, the Examiner asserts that it may not be possible to effect only the interface without alloying the entire thickness of the topmost layer. In response, Applicant notes that the irradiation conditions (i.e., the combination of (a) a light ions irradiation, and (b) the energy and the irradiation does are not high) set forth in Claim 1 and New Claim 14 enable irradiation ions to pass through a layer

comprising five atomic planes or less without significantly interacting with the atoms thereof. In other words, the irradiation conditions set forth in Claim 1 and New Claim 14 provide a very low probability of interaction between the irradiation ions and the atoms of the atomic planes (see New Claim 15 and 16).

III. New Claims

Applicant respectfully submits that New Claims 11-19 are supported by the original disclosure. New Claims 11-13 are dependent on patentable independent Claim 1 and therefore are also allowable. As to New Claims 14-19, Applicant submits that none of the cited references discloses or suggests a process for performing irradiation on a multi-layer material with (1) a beam of light ions having an energy of the order of or less than a hundred keV and (2) irradiation dose controlled so as to be a few 10^{16} ions/cm² or less such that the irradiation modifies a magnetic property of the buried layer of the multi-layer material. Additionally, with respect to Claims 15 and 16, Applicant notes that, the irradiation conditions set forth in Claim 14 enable irradiation ions to pass through a top layer comprising five atomic planes or less without significantly interacting with the atoms thereof. In view of the foregoing, Applicant is of the opinion that New Claims 11-19 are allowable.

CONCLUSION

In view of the foregoing, it is submitted that the claims are in condition for allowance. Reconsideration of the rejections and objections is requested. Allowance is earnestly solicited at the earliest possible date. If there are any fees due in connection with the filing of this response, please charge those fees to our Deposit Account No. 02-2666. If a telephone interview would expedite the prosecution of this Application, the Examiner is invited to contact the undersigned at (310) 207-3800.

Respectfully submitted,

BLAKELY, SOKOLOFF, TAYLOR & ZAFMAN, LLP

Dated: January 8, 2003

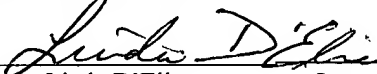


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CERTIFICATE OF MAILING

I hereby certify that this correspondence is being deposited with the United States Postal Service as first class mail in an envelope addressed to: BOX RCE, Commissioner for Patents, Washington, D.C. 20231, on the date shown below.



Linda D'Elia

January 8, 2003

Attachment: Version with markings to show changes made

VERSION WITH MARKINGS TO SHOW CHANGES MADE

IN THE CLAIMS

Claim 1 has been amended as follows:

1. (Amended) A [W]riting process for forming a pattern on a multi-layer material composed of thin layers deposited on a substrate, in which said multi-layer material is irradiated by means of a beam of light ions, having an energy of the order of or less than a hundred keV, [wherein the material is a thin-layers material comprising buried layers deposited on a substrate,] wherein one or more regions of the multi-layer material having individual sizes of the order of 1 micrometer or less are selectively irradiated, the irradiation dose being controlled so as to be a few 10^{16} ions/cm² or less, the irradiation modifying the composition of [2 or 3 nearest] atomic planes in the material around an interface between two layers of the [latter] multi-layer material [without overall mixing of the different layers of the multi-layer material].

The following new claims have been added:

--11. (New) Process according to claim 1, wherein said irradiation is capable of modifying the composition around said interface between two layers without measurably increasing the surface roughness of the multi-layer material.

12. (New) Process according to claim 1, wherein said irradiation is capable of modifying chemical composition of only one of the layers.

13. (New) Process according to claim 1, wherein chemical composition of at least one of the layers remains unchanged after the irradiation.

14. (New) A process for performing irradiation on a multi-layer material having a buried layer disposed between at least one top layer and at least one bottom layer, said process comprising:

selecting one or more regions of the multi-layer material having a width in the order of 1 micrometer or less; and

irradiating the selected regions of the multi-layer material with (1) a beam of light ions having an energy of the order of or less than a hundred keV and (2) irradiation dose controlled so as to be a few 10^{16} ions/cm² or less such that the irradiation modifies the buried layer of the multi-layer material.

15. (New) Process according to claim 14, wherein the irradiation is capable of modifying the buried layer of the multi-layer material without significantly interacting with atoms of the at least one top layer of the multi-layer material.

16. (New) Process according to claim 14, wherein the at least one top layer comprises five atomic planes or less.

17. (New) Process according to claim 14, wherein the irradiation modifies a magnetic property of the buried layer.

18. (New) Process according to claim 14, wherein the irradiation is capable of modifying the buried layer of the multi-layer material without significantly effecting an optical reflectivity of the at least one top layer of the multi-layer material.

19. (New) Process according to claim 14, wherein said irradiation is capable of modifying the magnetic property of the buried layer without measurably increasing the surface roughness of the multi-layer material.--